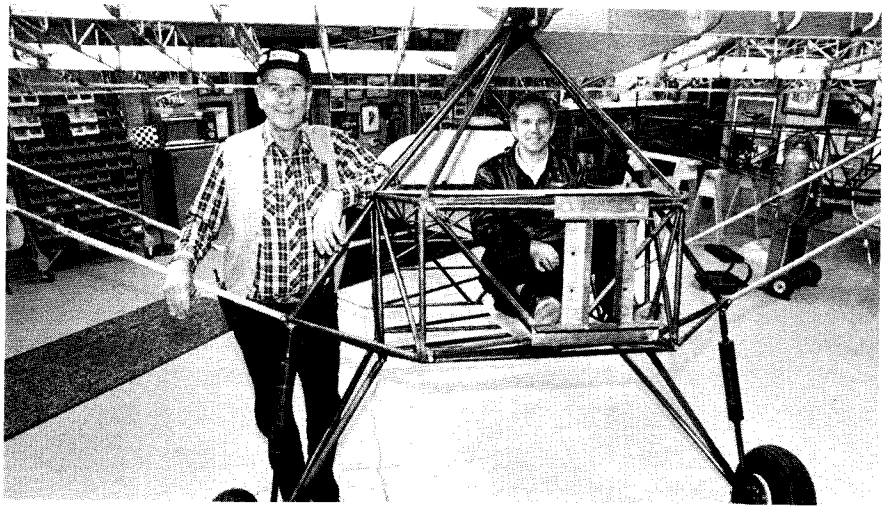
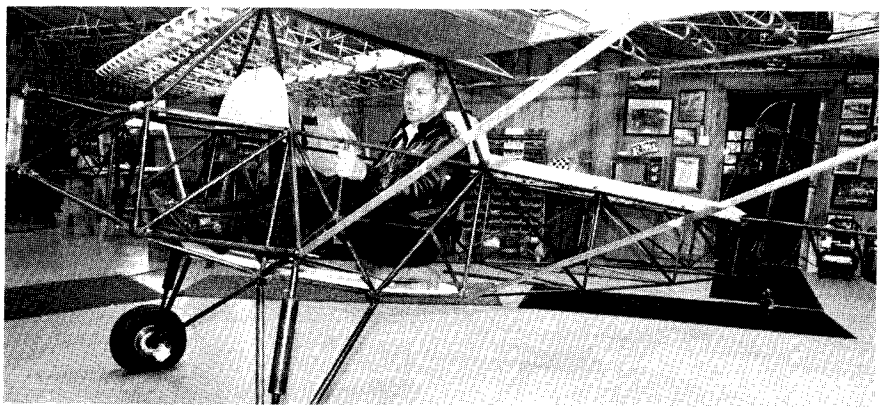
ACRO SPORT Newsletter

NO. 18 DECEMBER 1986



Ben Owen models the cockpit, while Paul poses for the cameraman. Note the wide landing gear. The engine mount is for the Cont. 65 through O-200 powerplants.

A bird's eye view of the 34 ft. wing shows the 1-1/2 degree dihedral. The Clark Y airfoil makes for an excellent high lift wing and should be very good for short field or mountain flying. Note the extra wide landing gear. The 6:00 x 6 wheels will add improved ground handling on rough fields.



Publisher Ben Owen tries the modified Pober Jr. Ace - (Corben) cockpit on for size (6'3" and 225 lbs.) Note plywood fuel tank area in upper left wing. Doors on left and right side of the fuselage are yet to be cut.

EDITORIAL BY PAUL H. POBEREZNY, PRESIDENT OF EAA

We are presenting some photos of the updated Corben Jr. Ace which has whetted the appetite of a number of enthusiasts whose tastes and aviation yearnings are for the "golden years" of aviation . . . the authentic look and appeal that in the past moved aviation to its present position.

As aviation progressed, the airports became larger because of the progress in design; landing speeds became higher, and what a comparison it is to fly an airplane that — when one looks down — the farmer's field looks so big! The thirty-four foot span, Clark-Y airfoil and the 6:00 x 6 wheels will make the Jr. Ace an ideal short field airplane. Powerplants from 65 HP to 100 can be utilized, The prototype of the modified Jr. Ace that I am working on will be powered by a Continental 85 HP engine. This will be a big improvement over the original powerplants of the 1930s of 40 to 45 HP!

The wider fuselage (9 inches wider than the previous Junior Ace) will give good comfort to us 200+ pounders . . . a wider baggage compartment . . . larger instrument panel . . . all around solid comfort! A wing tank in the upper left wing will connect to a smaller nose tank between the firewall and instrument panel. One could use the same drawing configuration and install a wing tank in the right wing for extended range as well.

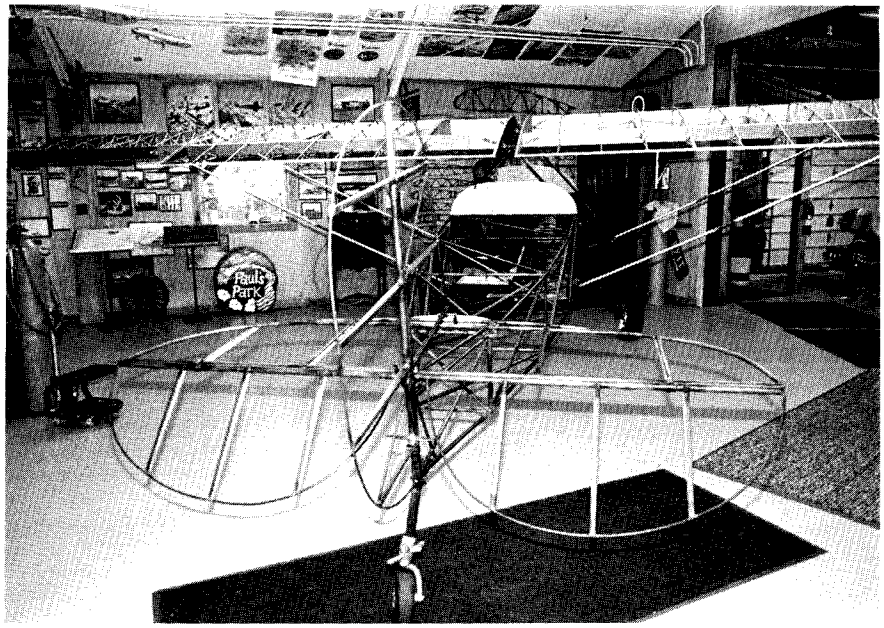
The original drawings, which are very well done, show the airplane in a cabin version and an open cockpit version as well. With a bit better imagination, I feel a better looking cabin version could be made, and I am sure that as more tubing and wood is cut, Jr. Ace builders will put touches to a good old basic airplane that would make Mr. Corben, and those associated with him back in the thirties, very proud. The drawing also shows detailed dual controls; both control sticks as well as rudder pedals. Again, with ingenuity we can update and make improvements as we have seen with other's designs. The original Junior Ace drawings have the updated modifications that I have done, and are a good start towards flying for fun. The Jr. Ace would also make a good program for

EAA's Project Schoolflight or a Chapter program.

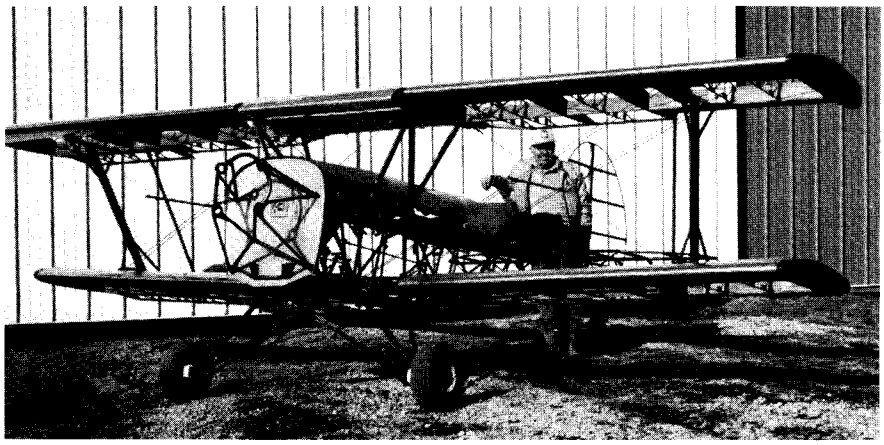
I have been taking many step by step photos as the Jr. Ace project has progressed, much the same as was done on the Acro Sport I single place, Acro Sport II two place and Pixie.

By the way, the manual *Techniques of Aircraft Building* is a very good publication for the builders of steel tube and wood aircraft. It contains many photos and drawings that are so very helpful, and I am pleased to have had a part in contributing to this "how to" manual. It is available from Acro Sport, Inc. for $12.00 post paid.

Some progress is still being made in my workshop on the modified Corben Super Ace. I have the vertical fin and rudder mounted, and horizontal stabilizer and elevator ready to mount. I guess I have broken my own record with three airplanes on one hacksaw blade! The Junior Ace, the complete Super Ace fuselage and tail group, and a number of fittings: an Acro I vertical fin and two horizontal stabilizers that all have been cut from one very good hacksaw blade! I think I had better frame the saw blade before I break it; the strain of wondering when it will break is becoming too great!



The Jr. Ace tail group is ground adjustable for trim purposes. The side by side seating allows for little changes in C/G as would tandem seating. The cockpit is some 40 inches wide, allowing for pilot and passenger comfort.



PAUL FELKNER'S ACRO SPORT PROJECT

As of summer 1986, this aircraft is all rigged. Paul Felkner, the builder, states, "Now I have taken it all apart for sand blasting, priming metal parts and for covering." Paul hails from Centerville, Iowa. Congratulations on the progress on your Acro Sport, Paul!

NOTES FROM CHAPTER 585'S NEWSLETTER

EAA Chapter 585 Newsletter Editor, Ray Mull, reported in his newsletter that, "On Friday after the last meeting, I flew my Acro II to Sikeston, Missouri, and attended the reunion of my old fighter squadron from WW II. It was great to get together with those OLD fighter Jocks and reminisce about those times. Most of the pilots who came are retired now. Many stayed in the Air Force or were recalled during the Korean conflict and stayed in to qualify for Military retirement. I had a super time, and the Acro Sport made the trip with flying colors. At every stop, the Acro received much praise and attention, and at the Sikeston airport, most of the reunion pilots and mechanics made a trip out to the airport on Saturday to see my airplane."

Ray is a Technical Counselor, also, for the chapter, and his current project includes a Seahawk.

Jean Kinnaman — President
Ben Owen — Publisher
Ann Ruby — Editor
Mike Drucks — Art Director

Welcome To The Staff Mike

PUBLISHER'S COMMENT

There's been a lot of telephone calls at EAA Headquarters regarding the Acro Sport, and I am always happy to talk with Acro Sport builders, or builder's of any aircraft, for that matter. It's just that the Acro Sport II appears to be the most popular of the Acro Sport designs at this particular point in time. However, I do keep the corrected plans for the Acro Sport I and II, the Pober Pixie, the Cougar and the Pober Jr. Ace - (Corben) of 34' span. If you wish to reach me directly with any building questions, you may contact me at EAA Headquarters, Wittman Field, Oshkosh, WI 54903-3086, or telephone (414) 426-4821. If you wish to order plans or the newsletter, contact Jean Kinnaman, President of Acro Sport, Inc., P.O. Box 462, Hales Corners, WI 53130, telephone (414) 529-2609. She now has an answering machine so that plans and newsletters can be ordered at any time. The newsletter, however, is published by myself, and edited by Ann Ruby here at EAA Headquarters. I might add that this is *your* newsletter, and you can determine its content just by giving me a call or dropping me a line. For instance, the Newsletter No. 17 after Oshkosh was mainly a pictoral, so that those who didn't attend the Oshkosh Convention could get an idea what Oshkosh was like, but also to recognize the builders.

It is a change from our usual format, and comments from you would be most welcome.

Some rib builders have asked about cyanoacrylic ("Super Glue"). I don't recommend this any more than I recommend 5 minute epoxy. Glues we do recommend include those recommended by the Forest Products Laboratory, 1 Gifford Pinchot Drive, Madison, WI 53705, telephone (608) 264-5600; such as resorcinal formaldehyde, a two part glue that turns brown and looks like shoe polish when it is put on and is waterproof; water resistant Weldwood one part glue is also an excellent glue. The epoxies like Sig epoxy or Hughes FPL 16A are also good. If you have to work in cold climates and you can't keep your shop at 70 degrees all the time the glue is drying, then you might consider using T-88 epoxy. However, resorcinal formaldehyde is still the room setting glue against which the room setting epoxies and most other glues are judged. It does require accurate joints, where epoxy will fill gaps. Dr. Brian River at the Forest Products Laboratory is an excellent reference on glues and wood.

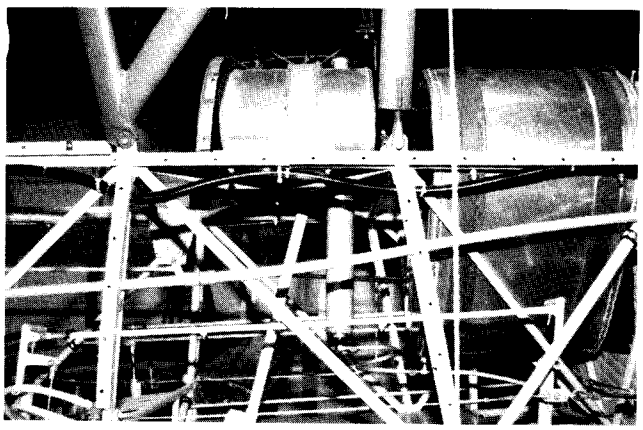
I have received some questions on engine mount length, and quite frankly, the Acro Sport II has pretty good tolerance to CG Shifts. The new book, titled, *CUSTOM BUILT SPORT AIRCRAFT HANDBOOK* available for $11.50 post paid from EAA Headquarters has quite a lengthy article using the Acro Sport II as a basis. We don't recommend unnecessarily long noses on the Acro Sport II. Some of our builders have found that the Acro Sport II flies fine with the hoizontal stabilizer parallel with the top longeron. Others have found that it flies a little better with the leading edge nose down as Bud Gores of Burlington, Wisconsin found.

A long while back, I mentioned to you that the A.C. fuel pumps were getting in short supply, and that they apparently weren't being manufactured any more. This AC diaphram type fuel pump, Part No. AC 41272 is used in conjunction with the Bendix PS-5C pressure carburetors. The last production run was made in 1980. One company which has a supply is Electronic Manufacturing Associates in Los Angeles, California, telephone (818) 998-2527, and the going price is approximately $315.00 each retail, $235.00 each wholesale. If you have a source of AC 41272 fuel pumps, please advise us and we will publish it in the newsletter. I hope you remember in the future that I warned you about this one a long time ago; back when they were a whole lot cheaper!

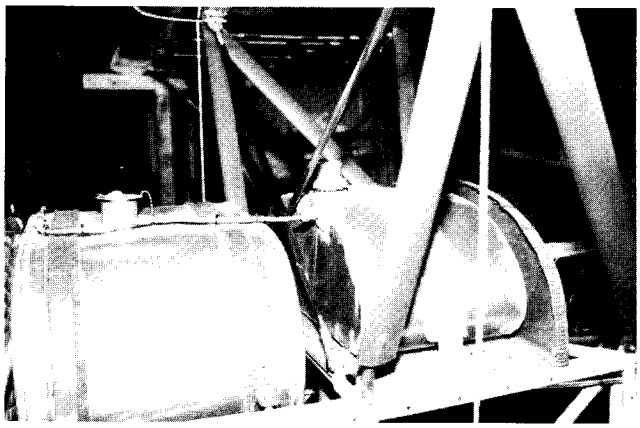
Every once in a while, I get a call from a builder who is starting out on an Acro Sport II and wants to know about the building sequence. The building sequence is pretty much up to you - a lot of people start with the wings, however it is quite possible to start with Sheet No. 1 on the Acro Sport and just work your way back, and of course, that would be fuselage first. You can do it however you like, but I want to caution you again that paper stretches and shrinks, and the rib drawings should be set up so that the center line of the spars is exactly 20 inches apart, so when you match the wings to the fuselage, things will fit. Any builders who have any questions about this can give me a call and I'll try to help you out with your planning.

Ben Owen, Publisher

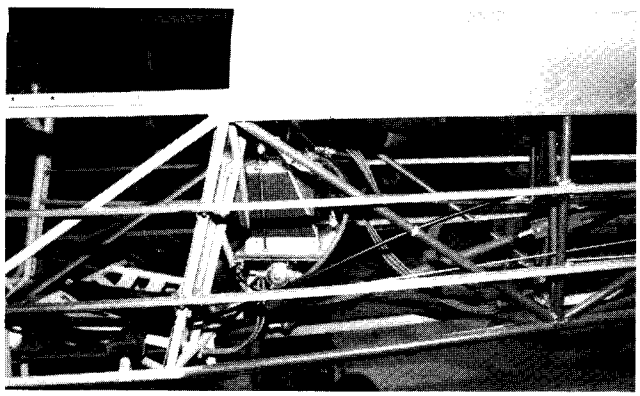
AN ACRO SPORT II BY BILL WILKINS



Builder, Bill Wilkins of Bowling Green, Ohio, and his modification. The 2-1/4 inch aluminum tube runs completely through the aft tank to approximately 2 inches above the main tank bottom, a safety factor - when the fuel gauge reads on the peg, you have maybe a gallon left. The alternate fuel draw and low point drain are the same.



The auxiliary tank weighed 6 lbs. and is very near to the C.G. Capacity 8+ gallons. Continuous cross feed system. Fuel gauge reads fuel in both tanks. Total fuel available - 32 gallons.



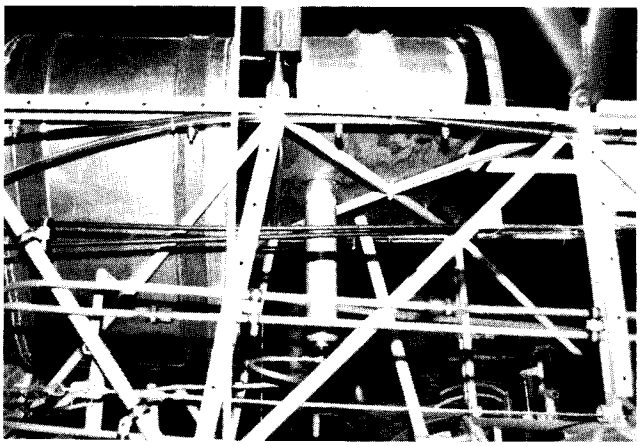
Gell cell battery and master solenoid mounted behind rear seat.

OOPS! CORRECTIONS TO ISSUE NO. 17

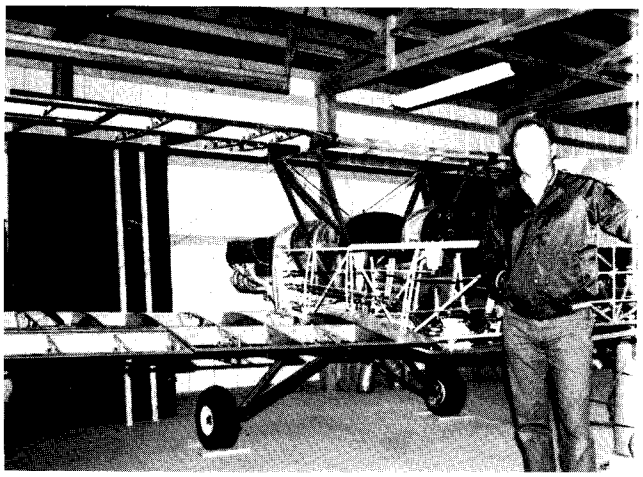
In our last issue, No. 17, SEPTEMBER 1986, we incorrectly identified the winners of the Acro Sport Awards. They should be as follows:

BEST ACRO SPORT II
LEE FARNSWORTH of Racine, Wisconsin won Best Acro Sport II Award.

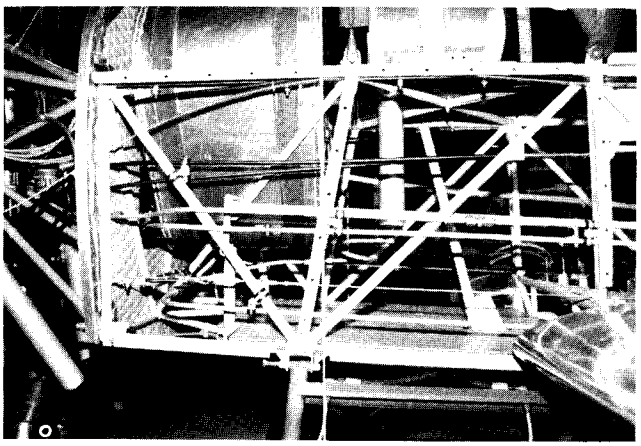
In issue No. 17, we incorrectly identified the Acro Sport I winner as Bob Bell, rather than Doug Bell. SORRY DOUG! But congratulations to all winners!



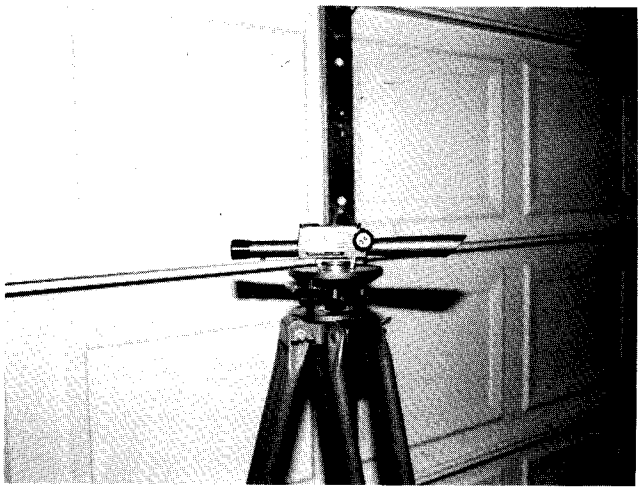
Shot angled up from the bottom shows plywood base for auxiliary tank. 1/2 inch holes were drilled in the 2-1/4 inch tube at the tank floor level for fuel to enter the tank, a 3/16th inch vent was drilled in the 2-1/4 inch tube at the tank top to vent the tube. Fuel gauge is a spiral float from Aircraft Spruce and Specialty Co.



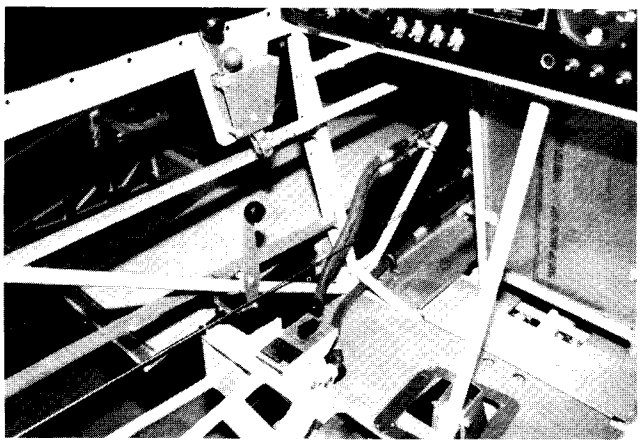
Bill Wilkins in the process of rigging his Acro II says, "I've been around for 42 years, used to build and fly RC models. I have a private license, 4-1/2 years, and presently own and fly a Citabria with about 60 hours on it."



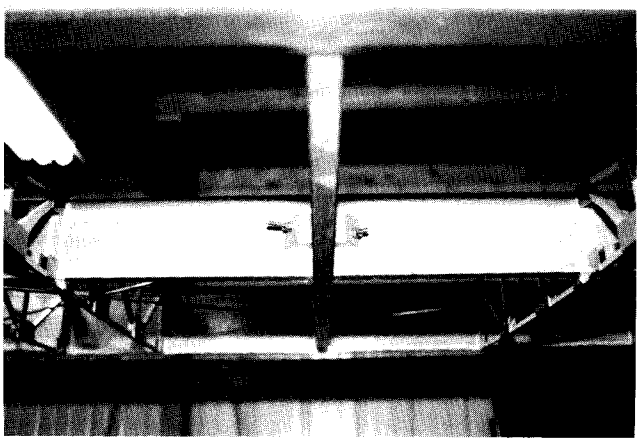
Look closely! Note cross feed coil from bottom of 2-1/4 inch tube to bottom fitting of main tank, then low point drain forward, turning and coming under rudder cable, then toward the rear to wobble pump. I expect my fuel system to have 100 percent useable fuel, however it is design concept that you will never have to use those last 2 inches!



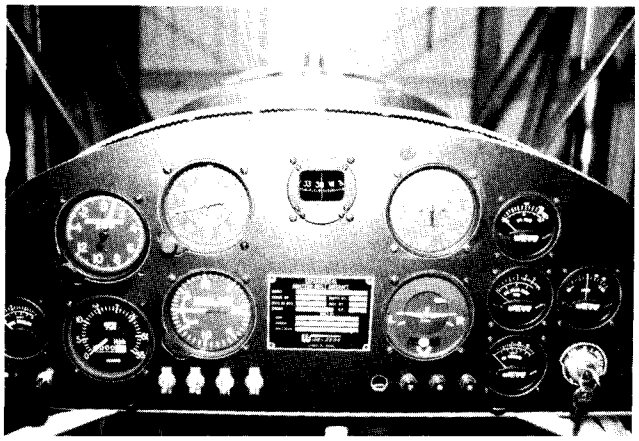
Transom - "Best rigging tool made." Everything + or 1/32nd of an inch.



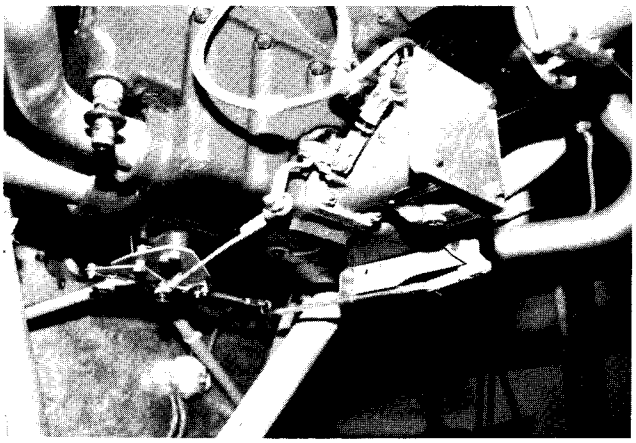
Rear cockpit detail, 3 fuel lines, top - from flop tube pickup; middle - to engine; bottom - from bottom of tank serves as alternate fuel draw and low point drain.



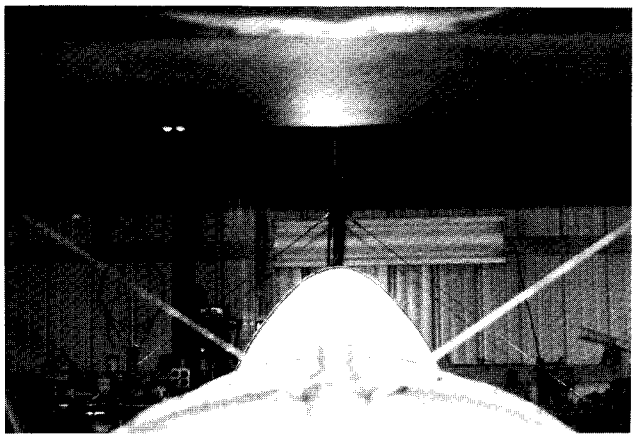
More of Bill Wilkins ideas. Note .063 inch steel plates for pull blocks - great idea!



Instrument panel - engine instruments include oil pressure, oil temperature, cylinder head temperature, ammeter and fuel pressure.



Bill has installed an IO-360 A2B of 200 HP. Here shown are the throttle and mixture controls.



Looking from engine aft; note fin offset for 200 HP.

Acro Sport Builders — notify Acro Sport, Inc. to get your builder's completion certificate, suitable for hanging!

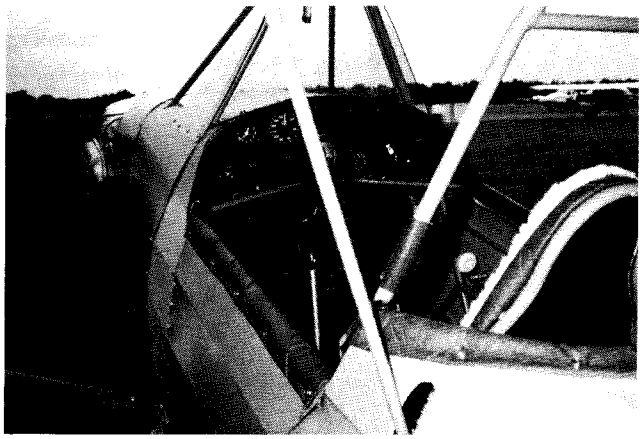
There is an article on the Junior Ace in the LIGHT PLANE WORLD magazine, December, 1986.

Thank you to all of our newsletter contributers, and please keep those letters and pictures coming!

MERRY CHRISTMAS and HAPPY NEW YEAR from Jean, and your newsletter staff!

PIXIE PHOTOS FROM JEAN R. CHEVALIER

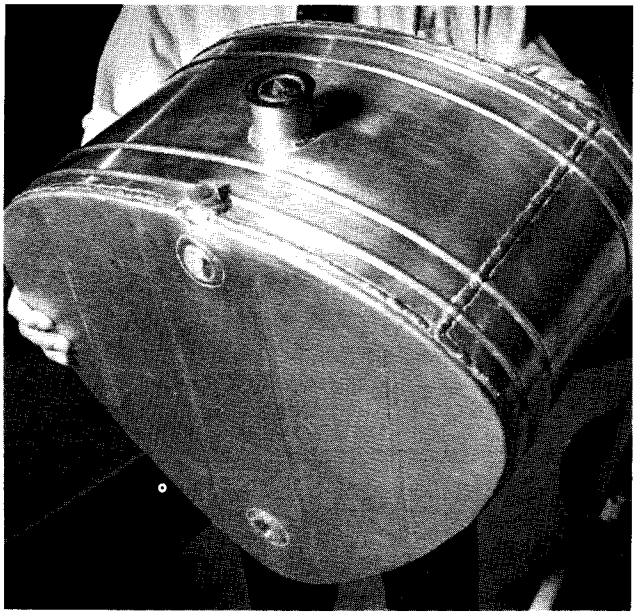
Jean R. Chevalier of Drummondville, Quebec, Canada sent these photos in. Jean has scratch built this Pober Pixie in 1/3 scale, and he is very proud of it. This Pixie makes an excellent and docile model, and this particular one has over 100 flights on it. The Pober Pixie in silver was completed by Mario Chavot, also of Drummondville, and as you can see from the close up photo, it has a very nice instrument panel, rubber rolls around the cockpit edge and sheepskin seat! Hopefully, Mario will send us some more details on this later.



CUSTOM FUEL TANK SERVICE

Have your fuel tank built to your custom specifications for approximately $250.00 per tank. Builder is experienced in the construction of tanks for amateur built aircraft over several years. The weight of the tank is 8 lbs., 12 oz. Contact Benny Davis, Route #2, Corydon, IA 50060. Telephone (515) 872-2032.

Photograph of Benny's tank by Carl Schuppel, EAA Staff Photographer.



REPORT ON VERN ROBERT'S PIXIE PROJECT

Bill Rodgers, an EAA Technical Counselor in McAlpin, Florida, reports that Vern Robert's Pixie, in Live Oak, Florida, is on the gear, control cables and pulleys are installed, tail feathers ready to cover, wings ready to cover, all work appears to be of very high quality and done in accordance with good aircraft practice. Vern has decided on an 85 HP Continental, and Bill suggested an indented firewall and swing out engine mount.

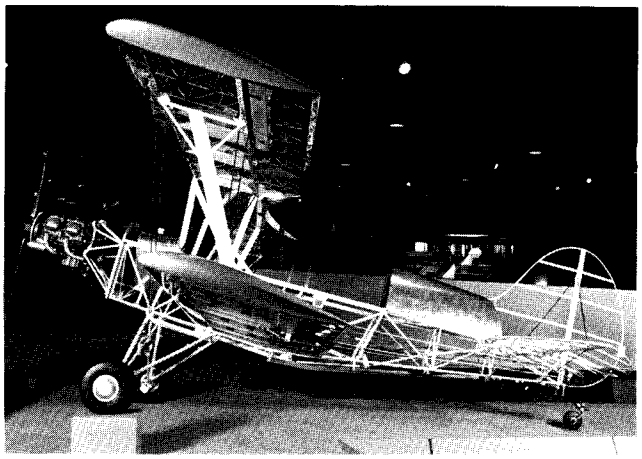
PLANS AVAILABLE FROM ACRO SPORT, INC.

P.O. Box 462, Hales Corners, WI 53130
Telephone (414) 529-2609
(New Prices As of 12/86)

PLANS FOR	PRICE	SHEETS
Acro Sport I	$60.00 post paid	24
Super Acro Sport (with wing supplement)	$75.00* post paid	26
Acro Sport II	$85.00 post paid	23
Pober Jr. Ace - (Corben)	$85.00 post paid	37
Pober Super Ace - (Corben)	$85.00 post paid	17
Cougar	$60.00 post paid	14
Pober Pixie	$60.00 post paid	16

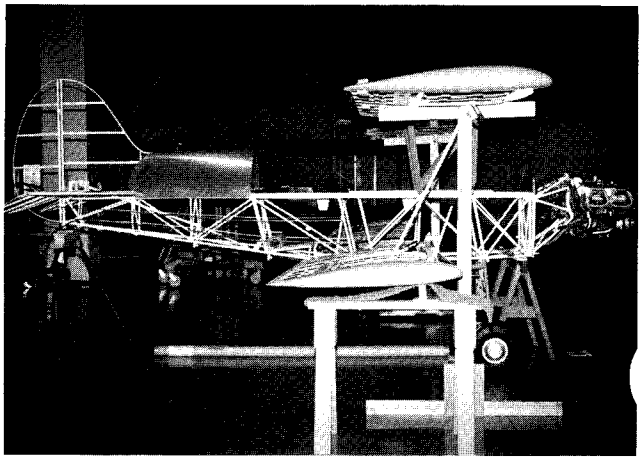
*This includes the plans for the Acro Sport I at $60.00, plus the wing supplement for $15.00. This may be used on the Acro Sport I **ONLY!**

ALSO AVAILABLE: The Book, "Techniques of Aircraft Building" - $12.00 post paid, and the Acro Sport Newsletter, 4 issues per year, $12.00 per year.

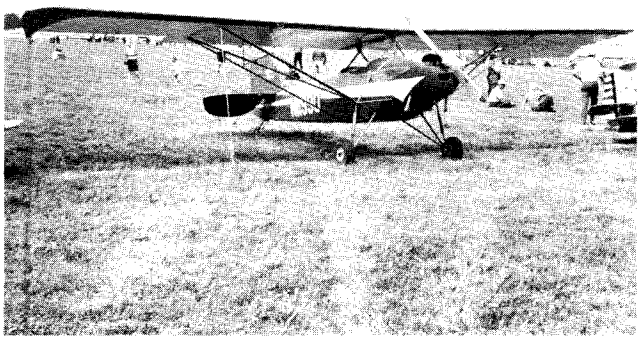


EAA MUSEUM'S ACRO SPORT DISPLAY

This Acro Sport is completed to cover and on display with an O-235 engine in the EAA Museum.

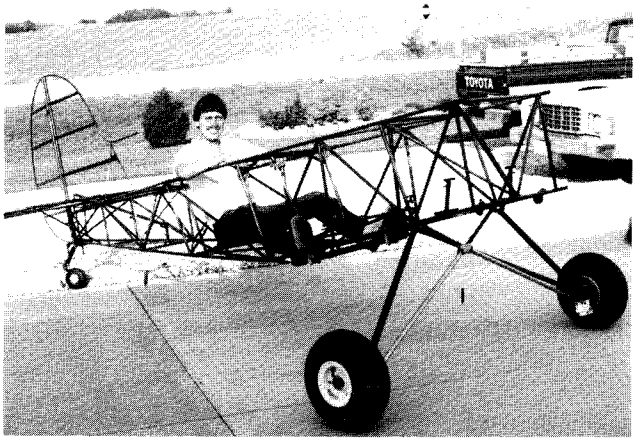


This Acro Sport is under construction and being jigged up in the EAA shops. They are, respectively, the 2nd and 3rd Acro Sports being completed by our personnel. It helps us a great deal in answering questions! Photos by Carl Schuppel, EAA Staff Photographer.

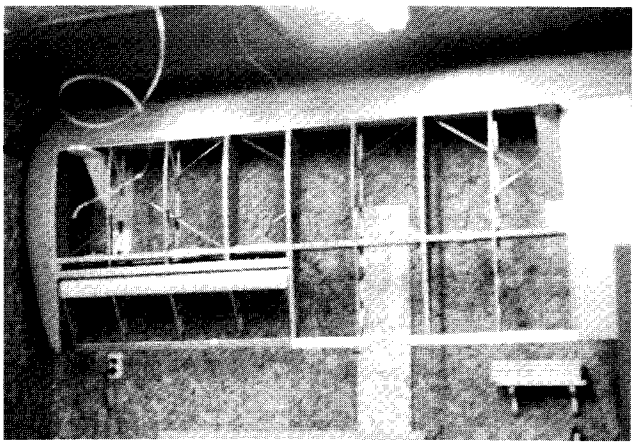


The Pober Jr. Ace - (Corben) information packet is $5.00, and the plans are for sale at $85.00. The Pober Jr. Ace - (Corben) is a large size airplane, with a total wing area of 168 sq. ft. With its wing area and the Clark Y airfoil, it is able to stall very slowly. Performance will vary, depending on engine installed. Plans include 31 sheets of original Corben drawings, plus 6 sheets of Pober modifications, such as wider fuselage, etc.

PAUL MUHLE'S ACRO SPORT II PROGRESS



Paul Muhle, of Richland, Nebraska, proudly sits in his Acro Sport II fuselage.



EAA Technical Counselor, Paul Regan of Columbus, Nebraska, reports that "excellent welding and complete fuselage and empennage, wings are complete except for covering. No problems have been found at this date. Aircraft is 60 percent complete. Good work!" Paul Regan says that builder Paul Muhle started the aircraft December 1984, and has a Lycoming IO-360 A1A purchased and restored, and he plans to include a battery and electrical system, and also a Pitts type double canopy for the fuselage.

DRAG-ANTI-DRAG WIRES

Drag-anti-drag wires for an Acro Sport II can be quite expensive. The best, top of the line wire is available from MacWhyte Wire Rope Company, 2900 14th Avenue, Kenosha, WI 53140, telephone (414) 654-5381. I also note our friend, Nick D'Apuzzo has a wire sales advertisement listed under "A. Wheels", P.O. Box 174, Ambler, PA 19002, send a stamped return envelope for illustrated list.

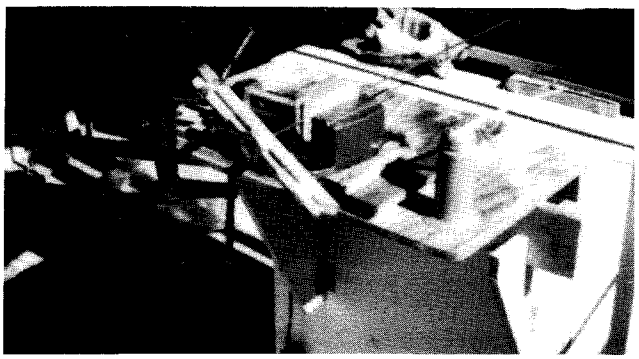
Some people have endeavored to build their own wires, and I understand that there might be an Acro Sport or two flying using threaded 4130 rod. A difinitive article, by the way, on the MacWhyte wires was published in the March 1969, page 15, SPORT AVIATION magazine. If you don't have an issue, possibly an old time member in your chapter will. If you wish to drop a note to Ben Owen at EAA Headquarters, Wittman Field, Oshkosh, WI 54903-3086, we would be happy to send on a copy of the article to you.

Basically, what it says is that MacWhyte uses stainless steel 18-8 type 316. This has a tensile strength of 150,000 P.S.I., which is cold worked to 215,000 P.S.I. Most of the home fabricators of drag-anti-drag wires have used 4130N, which has a tensile strength of about 90,000 - 110,000 P.S.I. The thing you have to remember about the MacWhyte fabricated rods is that they have a machine that will grab both ends and pull the wire out thinner, so the wire thins down to about the minor axis of the threaded end. When you take a straight rod of 4130N and thread the ends, your minor axis is the determining factor in the strength. If you use 90,000 lbs. as the strength of 4130N, we find that rod having a minor axis of 1/4 inch has a strength of about 4,408 lbs. Of course, you realize that you have to have larger rod than 1/4 to get a minor axis of 1/4 inch! If the minor axis is 3/16 inch, you'll come up with a strength of about 2,485 lbs. A rod with a minor axis of 1/8 inch has a strength of about 1,104 lbs. It is a case of "you have to do your own calculations" with the particular die that you are using. The formula for area is Pi times Radius squared.

Some people think that the ends of tie rods are rolled. As the March, 1969 *SPORT AVIATION* article clearly states, "they use a thread chaser and lots of lubrication to cut the threads on the ends of tie rod and flying wires." You can approximate this by hand, or with a lathe, by making gradual cuts until you get the depth or minor diameter that you need. If you are going to do it on a lathe, make gradual cuts until you get the depth or minor diameter that you need. If you are going to do it on a lathe, you might also want to somewhat round the cutting tool so that the bottom of the groove isn't a sharp groove. To quote someone who tried this, Marshall Berman of Phoenix, Arizona . . . "As I discovered, hand threading drag wires is a lot harder than it looks. Getting an even, square start is a hit-or-miss proposition. In fact, I wasn't able to get an even thread on left hand cuts at all. . . they all came out way off center . . . and the practice runs were many! So, out of desperation, I tried a simple starting guide, as shown in the photograph below, and it worked perfectly every time.

"The stick is just a scrap of 3/4 inch X 3/4 inch held in place with hose clamps. The guide hole is, of course, drilled on a drill press exactly the size of the rod to be threaded and aligned for clamping by cutting just a couple threads on the end, by hand, to hold it in place. A bolt of the same size would work as well. I only used the guide until the rod end cleared the die to avoid clogging with chips. But, it's no problem to start all the rods at the same time and then remove the guide to complete the cuts. It's the start that's critical anyway."

NOTE: Wires must be of the proper diameter, so that when they are threaded with the die, they fit properly in the forks. This is admittedly, a difficult operation.



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